CIGRE Study Committee C3

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG* N° C3.15	**Name of Convenor :** Marijke Wassens (Netherlands) **E-mail address**: marijke.wassens@movares.nl
Technical Issues # (2): 7, 9 and 10	**Strategic Directions # (3): 3 and 4**
The WG applies to distribution networks (4): Yes	
Title of the Group: Best environmental and socio-economic practices for improving public acceptance of high voltage substations	

Scope, deliverables and proposed time schedule of the Group :

Background :

To meet the growing demand for electric energy there is a need to expand the transmission grid capacity and restructure the grid system, in particular in urban areas. Social acceptance is an increasingly important factor: most people understand the need for an electricity system but do not want to have the corresponding infrastructure built in their vicinity. In addition to uncertainty concerning sound and electromagnetic-fields (EMF), the degradation of the landscape (visual impact) and the corresponding reduction in value of real-estate are the main objections.

The most important stakeholders in this discussion are the asset owner, the public community and in some cases the local authorities. In general, the acceptance of substations in terms of landscape integration will increase if alternatives are available, especially if some of these alternatives offer added value (through public functions) or are better suited to the surrounding area. Because of the public debate, the realization of projects is increasingly affected. Worldwide there is much attention paid to the integration of substations, especially the lower voltages but extensive attention and experience in substations with higher voltages is underexposed until now.

Scope :

The working group aims to make an inventory of the best practices, options, and boundary conditions for the integration of substations in their environment. The inventory will consider differences in landscapes and the feasibility of (for example) the re-use of buildings or other infrastructure. Various other issues and options will be taken into account such as environmental considerations (e.g. SF_6), land use, electrical safety, reliability, security of supply and constraints during operation, possibilities for future expansions, etc.

Cigre has presented in the past some studies that can be useful for our work, like TB 221, or other documents about the impact of substations on the environment. This WG will take this information into account. The WG will work particularly closely with SC B3 (substations) who have offered assistance for our work.

The purpose is to provide a balance between the TSO's perspective and the environmentally-associated social needs/demands.

The resulting Brochure aims to be an international reference document to be used in the discussion with other stakeholders. It shall help to identify workable solutions from environmental and socio-economic perspectives and increase acceptance by local authorities, without placing onerous hardships on the affected TSO's.

Issues to be discussed in the WG:

1. What are general processes, procedures, methods and experiences used in different countries to integrate substations into their local environments? This will include an

overview of decision makers, planners and other stakeholders involved.

2. Which methods/techniques are considered viable and used by different countries to improve acceptability and decrease the visual impact of substations?
3. Which elements are most dominant in the public acceptance of new projects? Is this the substation as a system, is there a difference between GIS and AIS, are the incoming lines and cables part of this acceptance? In other words, we have to discuss the boundaries of our work, reduce the scope, to make it manageable.

The WG will proceed by:

I. Outlining an inventory and review of relevant publications, such as Cigre technical brochures;
II. Learning from and using the results of the work of JWG B1/B2/C3;
III. Collecting and analysing approaches used in different countries using case studies;
IV. Listing the information obtained in the previous steps in a database, accessible for TSO's and other Cigre members;
V. Gathering motivations for successful approaches and classifying them;
VI. Summarising the information in a technical document and presenting it in a CIGRE Brochure

The WG will not attempt to promote one approach over another, because the relationship between substations and its local conditions will be different between countries and even within countries. This is due to common practice, and to different legal and social acceptance and ownership reasons.

Deliverables : Technical brochure with summary in Electra

Time Schedule : start : August 2016 **Final report** : September 2019

Comments from Chairmen of SCs concerned :
Comments from TC are included in this final version. In response to the comment from SC B1 we confirm that GIL is not included in the present scope.

Approval by Technical Committee Chairman : M. Wald
Date : 16/12/2015

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (cf. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non technical audience